

DETECTION OF FETAL VIABILITY USING REAL TIME B MODE ULTRASONOGRAPHY IN CORRIEDALE SHEEP

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ABSTRACT

The present study was conducted in eight Corriedale ewes at an organised Sheep Breeding Farm to assess the fetal viability through trans-rectal B-mode real time ultrasound machine with a linear array transducer of 7.5 MHz and 5 MHz frequencies. The ewes were scanned from day 18 to 90 of gestation at weekly intervals. The presence of turbid uterine fluid without cardinal signs of pregnancy confirmed the fetal mortality at day 60 and 73 of pregnancy.

Key words: Sheep, ultrasonography, fetal mortality, pregnancy

The application of real-time ultrasonography to study animal reproduction represents a technological breakthrough that has revolutionized knowledge of reproductive biology. New information generated through ultrasonic imaging has clarified the nature of complex reproductive processes in animals including ovarian follicular dynamics, corpus luteum function and fetal development. One of its most important applications is to visualize the embryo or fetus in womb. The procedure is a standard part of prenatal care, as it yields a variety of information regarding the health of the mother and fetus, the progress of the pregnancy and developmental defects of the fetus. Early pregnancy diagnosis and fetal quantification through ultrasonography contribute to rationalize management and bring financial benefits to ovine production. This method allows non-pregnant ewes or bearing reproductive problems to be culled from the herd thereby decreasing feed costs (Lee *et al.*, 2005). Moreover, the distinction of single and multiple fetuses allows the breeder to provide a more adequate nutritional management at the end of gestation thereby optimizing birth weight and survival (Gearhart *et al.*, 1988; Santos *et al.*, 2007).

Lindhahl (1971) was the first to use B-mode real time ultrasonography with a 5.0 MHz rectal probe in ewes. Fowler and Wilkins (1980) used ultrasonic scanning in ewes and found accurate, rapid, safe and practicable means of pregnancy diagnosis. Sonography is considered superior to other non-imaging techniques because it is

non-invasive, more accurate and enables the veterinarian to detect viability of conceptus (by visualizing flickering of heart beats) and its dimensions (Logue *et al.*, 1987; Buckrell, 1988). Introduction of computer systems to ultrasound machines has enabled the storage, processing and presenting of large amounts of data, allowing the production of static two-dimensional grey scale images and real-time imaging. The fetal mortality reported here was detected during ultrasonographic studies on fetal development in sheep.

MATERIALS AND METHODS

The present study was carried out at the Sheep Breeding Farm of the university. Eight Corriedale ewes of known mating dates were selected. A high quality real time, B-mode diagnostic ultrasound machine (Pi Medical Vet Scanner- 200) equipped with a linear array transducer of switchable frequency between 5.0-7.5 MHz frequency designed for per-rectal approach was used. These eight ewes were removed from the flock for first scanning at day 18 of pregnancy and subsequently uterine ultrasonography was performed at weekly interval from day 18 to 90 of gestation. Rhythmic heartbeats were counted for 5-15 sec in embryos for the detection of embryonic viability.

RESULTS AND DISCUSSION

No fetal abnormality was observed during initial phase of pregnancy and the fetus was surrounded by clear anechoic fetal fluid in uterine lumen (Fig. 1). However, the fetal pathological abnormalities were

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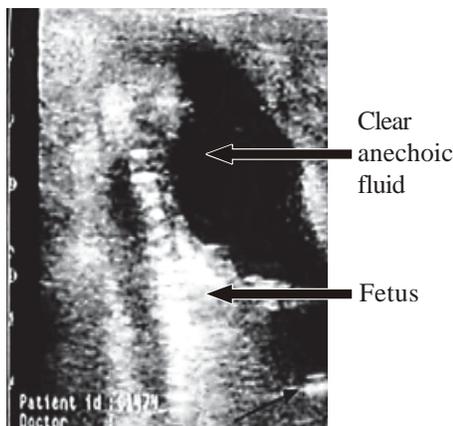


Fig 1. Normal fetus surrounded by clear anechoic fetal fluid in uterine lumen

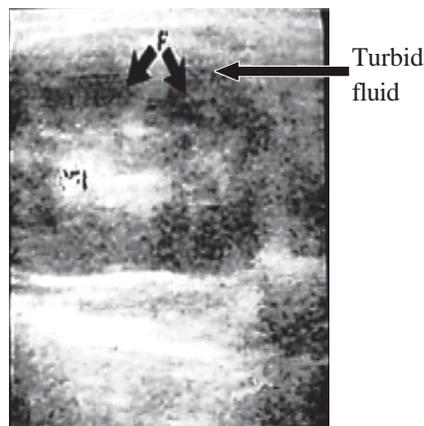


Fig 2. Turbid fluid and compact fetal skeleton in dead fetus

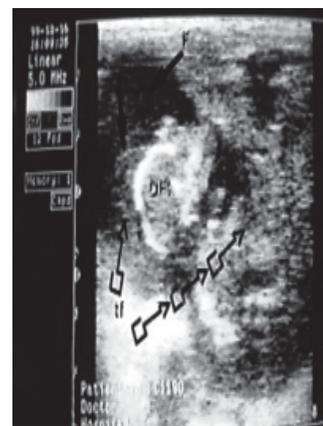


Fig 3. Abnormal fetus in a sheep at day 73 of gestation showing turbid fluid and crumbled fetal skeleton

observed at day 60 of conception. Very distinct picture of the dead fetus was seen. The cardinal sign of the pregnancy viz. fetal heartbeat, fetal movement and anechoic fetal fluids were not observed. There was absence of the normal reflection from the accumulated fluid because of echoic spots of dead fetus in the anechoic area. No proper morphology of fetal skeleton and placentomes was observed. Turbid appearance of the amniotic fluid confirmed the dead fetus (Fig. 2). The other fetus present (twin) in this animal had normal echo-texture (fluid and skeleton). At day 73 of gestation in other sheep similar pathological abnormalities such as turbidity of the uterine fluid with no cardinal signs of pregnancy confirmed the mortality of fetus (Fig. 3). Roberts (1971) observed 20-30% fetal mortality from day 20 to parturition in bovines.

Fetal attrition in early stages cannot be diagnosed easily and goes unrecorded in ewes. Schrick and Inskip (1993) reported the absence of heartbeat at day 25 and day 40 in sheep. But, Jones and Fecteau (1995) confirmed the presence of hydrops uteri by observing little number of placentomes without any typical C-shaped and no evidences of fetus in caprine. Kahn (1994) reported that the reason of erroneous diagnosis was that an animal found pregnant in very early stage of pregnancy can suffer embryonic loss and later be counted as a false positive diagnosis. Therefore, B-mode ultrasonography is the best non-invasive technique to study the liveability of developing conceptus. It is concluded that the fetal mortality can be diagnosed easily in sheep with ultrasonography. In such cases absence of heartbeat, fetal movement and change in echoicity of fetal fluid was seen.

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